

CLAIMS

1. An air refrigerant type freezing and heating apparatus comprising:

5 a compressing mechanism which compresses an air refrigerant;

a heating unit which heats a first object by said air refrigerant outputted from said compressing mechanism;

a heat exchanger which cools said air refrigerant outputted from said heating unit;

10 a turbine which expands said air refrigerant outputted from said heat exchanger; and

a cooler which cools a second object different from said first object by said air refrigerant outputted from said turbine.

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2. The air refrigerant type freezing and heating apparatus according to claim 1, wherein said compressing mechanism is composed of a single compressor.

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3. The air refrigerant type freezing and heating apparatus according to claim 1 or 2, further comprising:

25 a heat recovery unit which recovers heat of said air refrigerant outputted from said heating unit and heats said air refrigerant flowing between said compressing mechanism and said heating unit.

4. The air refrigerant type freezing and heating apparatus according to claim 3, further comprising:

a second heating unit which heats an object by said air refrigerant flowing on a subsequent stage side of said heat recovery unit and on a prior stage side of the heat exchanger.

5. The air refrigerant type freezing and heating apparatus according to any one of claims 1 to 4, further comprising:

a heater which heats said air refrigerant flowing in said heating unit.

6. The air refrigerant type freezing and heating apparatus according to any one of claims 1 to 5, wherein said heater is an oven.

7. An air refrigerant type cooling and heating system comprising:

an air refrigerant type freezing and heating apparatus according to any one of claims 1 to 6;

a regenerator which is filled with an absorbent absorbing a refrigerant different from the air refrigerant, heats and evaporates said refrigerant mixed in said absorbent by using said air refrigerant outputted from said compressing mechanism;

a condenser which condenses said refrigerant

evaporated by said regenerator;

an evaporator which evaporates said refrigerant condensed by said condenser and cools a third object by heat of evaporation; and

5 an absorber which allows said absorbent outputted from said regenerator to absorb said refrigerant evaporated by said evaporator and outputs said absorbent to said regenerator.

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8. The air refrigerant type freezing and heating apparatus according to any one of claims 1 to 7, wherein the compressing mechanism is a compressor which rotates coaxially with said turbine,

15 said air refrigerant taken in from said cooler is supplied to a low-temperature side flow passage of said heat exchanger, and

said air refrigerant outputted from said low-temperature side flow passage is directly supplied to said
20 compressor.